

MNWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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Epidemiologic Notes and Reports

Plasmodium falciparum Malaria Contracted in Thailand Resistant to Chloroquine and Sulfonamide-Pyrimethamine — Illinois

CDC recently received reports of malaria chemoprophylaxis failure in 3 U.S. physicians returning from work in the refugee camps along the Thai-Kampuchean border. These reports, detailed below, support other evidence that strains of *Plasmodium falciparum* resistant to Fansidar* therapy are prevalent in that area.

On March 27, 1980, an American physician from an Illinois hospital arrived in eastern Thailand, where he worked at Khao-I-Dong and Sak-Son, 2 Khmer refugee camps along the Thai-Kampuchean border. He began weekly malaria chemoprophylaxis with chloroquine-primaquine (300 mg chloroquine base + 30 mg primaquine base) 2 weeks before arrival and Fansidar (500 mg sulfadoxine + 25 mg pyrimethamine) on arrival. On April 9, while residing at Sak-Son and based upon local recommendations in the refugee camp, he started quinine, approximately 100 mg (one-third tablet) 3 times a day. All prophylactic medications were reportedly continued until May 11, 6 days after he returned to the United States.

Soon after his return on May 5, the physician developed fever, which continued intermittently until he was admitted to the hospital on May 11; examination of a blood smear revealed *P. falciparum*. Oral therapy was begun according to CDC recommendations with quinine sulfate 650 mg (base) every 8 hours for 3 days, sulfadiazine 500 mg every 6 hours, and pyrimethamine 50 mg daily for 5 days (1). He became afebrile by the third day of therapy.

Fever and headache returned 5 days after the patient had finished therapy; at that time, 0.1% of his red blood cells were parasitized with *P. falciparum*. In-hospital therapy was begun on May 22 with quinine sulfate 325 mg (base) 6 times daily, tetracycline 250 mg 4 times daily, and sulfadiazine 500 mg 4 times daily for 10 days. Again, fever promptly cleared and he remained well until mid-June.

On June 17 and July 8, he experienced additional malaria attacks due to *P. vivax*. Following therapy with chloroquine 1.5 g over 3 days and primaquine 15 mg (base) daily for 14 days after the last attack, he has remained well.

Two other physicians from the same hospital lived and worked in the 2 refugee camps with this physician. Both had the same chemoprophylactic regimen as the first physician, and each experienced a documented *P. falciparum* infection within 1 week of returning to the United States. Similarly, these 2 physicians had a *P. falciparum* recrudescence following therapy in the hospital with the recommended quinine-sulfadiazine-pyrimethamine

*Inclusion of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Malaria — Continued

regimen. The recrudescences were successfully treated with a 10-day course of quinine and tetracycline.

The *P. falciparum* parasites from the initial recrudescence of the index patient have been cultivated *in vitro* and passaged in non-human primates at CDC laboratories. *In vitro* drug-sensitivity testing, using the 48-hour test of Nguyen-Dinh and Trager (2), has demonstrated that the strain is highly chloroquine- and pyrimethamine-resistant.

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Editorial Note: In distinct contrast to the majority of *P. falciparum* infections reported in American travelers, these physicians contracted malaria while taking the recommended chemoprophylaxis. For southeast Asia, the combination of Fansidar (for *P. falciparum*) and chloroquine (for *P. vivax*) is the accepted regimen (3). The addition of quinine should have provided additional protection against *P. falciparum* malaria, although the daily dosage taken was about one-half that recommended, 325 mg twice a day (4).

The relapses of *P. vivax* experienced by the first physician following cure of the *P. falciparum* infection are not surprising because prophylaxis with chloroquine-primaquine was not continued for the entire 6-week period after return to the United States, as recommended.

Failure of sulfadoxine and pyrimethamine to radically cure *P. falciparum* infections has been recognized recently in eastern Thailand. A study in Sa Kao I refugee camp details Fansidar resistance in all of a series of 9 patients treated there during April 1980. Studies are in progress to determine the extent of Fansidar and quinine resistance in *P. falciparum* in Khmer and Thai populations. It is clear, however, that along the Thai-Kampuchean border, the majority of *P. falciparum* strains are resistant to Fansidar therapy and, presumably, to prophylaxis. Until the geographic extent and prevalence of resistance to Fansidar are defined, recommendations for alterations in prophylactic regimens for travelers to eastern Thailand are not possible. Consideration, however, should be given to the benefits and risks of daily quinine prophylaxis for persons staying overnight in camps along the Thai-Kampuchean border, using at least the recommended daily dosage of 325 mg twice a day. These individuals can also reduce the risk of acquiring malaria in these areas by sleeping under mosquito netting, wearing clothing that adequately covers the arms and legs, and applying mosquito repellent to exposed areas of the skin.

In the recommendations for the therapy of *P. falciparum* infection in Indochinese refugees (1), the combination of a 3-day course of quinine concurrent with a 10-day course of tetracycline was one of the regimens suggested. Few if any refugees from camps in these areas are currently immigrating to the United States or other countries. For those *P. falciparum* infections detected in the United States which presumably originated in refugee camps on the Thai-Kampuchean border or in Kampuchea, it is advisable, based on recent unpublished observations in the camps, to initiate therapy with quinine-tetracycline. For patients in whom tetracycline may be contraindicated, for example, in young children and pregnant women, it is still preferable to reserve the quinine-tetracycline combination for failures of quinine-sulfonamide-pyrimethamine therapy.

References

1. MMWR 1979;28:388-90, 395.
2. Nguyen-Dinh P, Trager W. *Plasmodium falciparum in vitro*: determination of chloroquine sensitivity of three new strains by a modified 48-hour test. Am J Trop Med Hyg 1980;29:339-42.

Malaria — Continued

3. MMWR 1978;27:81-90.

4. Covell G, Coatney GR, Field JW, Singh J. Chemotherapy of malaria. World Health Organization, 1955, pp. 86-89.

Toxic-Shock Syndrome — Utah

The Utah State Health Department began active surveillance of cases of presumed toxic-shock syndrome (TSS) in February 1980. In the next 7 months, 52 women were reported to state and University of Utah officials as having an illness consistent with the reported case description of TSS (1,2). Accordingly, a case-control study was initiated utilizing reported cases and a control group of menstruating women.* In selecting controls, interviewers went house to house in a predetermined manner, using the patient's house as the focal point until a control was found who had a history of recent menstrual periods; 4 controls were sought for each case. Interviews with cases and their controls began in May 1980 and were subsequently conducted as soon as possible after cases were reported. An extensive questionnaire involving the respondent's sexual, obstetric, gynecologic, and menstrual histories as well as socioeconomic conditions and use of contraceptives and vaginal hygienic products was administered to cases and controls. Controls were asked to relate their answers to the month of illness of the respective case.

Ultimately, 29 TSS patients with available medical records were enrolled in a case-control study. Twenty-seven of the 29 cases occurred in 1979 and 1980, with 20 of 29 (69%) occurring between February and August 1980 during the period of active surveillance. The 29 cases and their 91 controls were comparable in age, race, marital status, and other demographic features. All 29 TSS patients (100%) and 70 of 91 controls (77%) used tampons during the month of the TSS patient's illness ($p = .012$ by Chi square modified for studies with matched cases and controls) (3). Twenty-five TSS patients and 60 controls used 1 brand of tampon exclusively during their menstrual period. Of these exclusive brand users, 15 of 25 (60%) cases and 14 of 60 (23%) controls used Rely tampons ($p < .005$, relative risk = 6.11 using a matched linear logistic regression model) (4).

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Editorial Note: The statistically significant association of TSS and tampon use in menstruating women has now been shown by a number of studies (2,5). In addition, CDC studies recently have shown that Rely tampons were associated with a significantly increased risk of developing the illness as compared to other brands (5). The CDC studies used "best friend" controls; this may possibly have introduced a bias concerning products used. However, the Utah study has independently confirmed these associations with the use of neighborhood controls who were selected regardless of the existence of a relationship with a TSS patient; in fact, the controls were often unaware that a neighbor had had the illness.

The role that tampons and *Staphylococcus aureus* play in the genesis of TSS is not yet fully understood. The manufacturer of Rely, Procter and Gamble, withdrew Rely

*None of the cases in this study had been included in the CDC study.

Toxic Shock Syndrome — Continued

tampons from the market on September 22, 1980. However, a risk of developing TSS continues for menstruating women who use any tampons. CDC has recommended that women who wish to diminish their risk of TSS discontinue using tampons or use them only intermittently (that is, not use them all day and all night throughout the period). CDC studies have shown that most women change tampons every 4-6 hours, but have not documented that changing tampons frequently decreases the risk of TSS. If a woman chooses to continue using tampons and has high fever, vomiting, and/or diarrhea during her menstrual period, she should remove the tampon and consult her physician.

Several studies are continuing throughout the country in an effort to define better the causative factors of TSS and to answer many of the questions that remain concerning this syndrome.

References

1. Todd J, Fishhaut M, Kapral F, Welch T. Toxic-shock syndrome associated with phage-group-1 staphylococci. *Lancet* 1978;2:1116-8.
2. MMWR 1980;29:229-30.
3. Pike MC, Morrow RH. Statistical analysis of patient-control studies in epidemiology: factor under investigation an all or none response variable. *Br J of Preventive and Social Med* 1970;24:42-4.
4. Breslow NE, Day NE, Halvorson KT, Prentice RL, Sabai C. Estimation of multiple relative risk functions in matched case-control studies. *Am J Epidemiol* 1978;108:299-307.
5. MMWR 1980;29:297-9.

TABLE I. Summary — cases of specified notifiable diseases, United States*[Cumulative totals include revised and delayed reports through previous weeks.]*

DISEASE	41st WEEK ENDING		MEDIAN 1975-1979	CUMULATIVE, FIRST 41 WEEKS		
	October 11, 1980	October 13, 1979		October 11, 1980	October 13, 1979	MEDIAN 1975-1979
Aseptic meningitis	171	331	182	5,354	6,320	3,650
Brucellosis	1	6	4	144	138	180
Chickenpox	531	620	620	158,255	173,318	152,509
Diphtheria	—	—	—	3	58	73
Encephalitis: Primary (arthropod-borne & unspec.)	59	39	39	827	847	952
Post-infectious	6	4	4	172	191	192
Hepatitis, Viral: Type B	285	287	274	13,871	11,420	11,805
Type A	472	624	612	21,854	23,455	24,129
Type unspecified	178	199	142	9,126	8,056	6,604
Malaria	20	24	10	1,527	588	436
Measles (rubeola)	56	58	90	13,004	12,348	24,375
Meningococcal infections: Total	41	45	21	2,090	2,124	1,394
Civilian	41	45	21	2,079	2,106	1,385
Military	—	—	—	11	18	18
Mumps	76	126	231	7,386	11,566	16,807
Pertussis	42	20	45	1,340	1,099	1,243
Rubella (German measles)	19	48	56	3,377	10,873	15,122
Tetanus	—	1	1	55	56	58
Tuberculosis	402	443	459	21,474	21,686	23,793
Tularemia	4	4	3	164	165	109
Typhoid fever	12	12	11	375	403	335
Typhus fever, tick-borne (Rky. Mt. spotted)	25	16	15	1,058	957	941
Veneral diseases:						
Gonorrhoea: Civilian	18,860	19,845	19,845	784,627	786,028	786,028
Military	852	393	393	21,687	21,796	21,796
Syphilis, primary & secondary: Civilian	469	497	497	20,839	19,404	19,022
Military	2	2	5	249	244	244
Rabies in animals	83	113	66	5,107	4,075	2,457

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1980		CUM. 1980
Anthrax	1	Poliomyelitis: Total	7
Botulism	45	Paralytic (W. Va. 1)	5
Cholera	8	Psittacosis (Ups. NY 1, Wis. 1, Oreg. 1)	89
Congenital rubella syndrome	46	Rabies in man	—
Leprosy	166	Trichinosis	93
Leptospirosis (La. 2)	59	Typhus fever, flea-borne (endemic, murine) (La. 1, Tex. 2)	59
Plague	15		

All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending October 11, 1980, and October 13, 1979 (41st week)

REPORTING AREA	ASEPTIC MENIN- GITIS	BRU- CEL- LOSIS	CHICKEN- POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-in- fectious	B	A	Unspecified		
						1980	1979	1980	1980	1980	1980		
UNITED STATES	171	1	531	-	3	59	39	6	285	472	178	20	1,527
NEW ENGLAND	8	-	71	-	-	1	2	-	13	14	10	3	93
Maine	-	-	18	-	-	-	-	-	-	-	-	-	14
N.H.	-	-	4	-	-	-	-	-	-	1	-	-	7
Vt.	-	-	4	-	-	-	-	-	1	4	1	-	1
Mass.	5	-	18	-	-	1	1	-	2	4	9	3	49
R.I.	-	-	3	-	-	-	-	-	2	2	-	-	9
Conn.	2	-	24	-	-	-	1	-	7	3	-	-	13
MID. ATLANTIC	48	-	30	-	1	3	8	-	51	51	16	4	203
Upstate N.Y.	20	-	9	-	-	2	1	-	10	12	2	-	32
N.Y. City	3	-	11	-	1	-	-	-	14	13	4	1	56
N.J.	12	-	NN	-	-	-	1	-	27	26	10	2	53
Pa.	13	-	10	-	-	1	6	-	NA	NA	NA	1	62
E.N. CENTRAL	22	1	220	-	1	18	10	3	57	62	17	1	89
Ohio	9	-	8	-	-	12	6	-	6	8	4	-	14
Ind.	-	-	34	-	-	-	2	-	7	6	7	-	12
Ill.	5	-	16	-	-	-	-	-	25	20	1	-	32
Mich.	8	-	72	-	1	4	1	-	19	27	5	-	22
Wis.	-	1	90	-	-	2	1	3	-	1	-	1	9
W.N. CENTRAL	4	-	56	-	1	5	4	-	11	33	8	1	64
Minn.	-	-	-	-	-	-	-	-	4	18	2	-	21
Iowa	-	-	30	-	-	3	4	-	2	3	-	-	7
Mo.	-	-	-	-	1	1	-	-	1	7	4	-	13
N. Dak.	-	-	5	-	-	-	-	-	-	-	-	-	4
S. Dak.	-	-	10	-	-	-	-	-	1	3	-	1	4
Nebr.	2	-	4	-	-	1	-	-	3	-	-	-	7
Kans.	2	-	7	-	-	-	-	-	-	2	2	-	12
S. ATLANTIC	48	-	48	-	-	5	1	1	70	91	25	6	164
Del.	-	-	-	-	-	-	-	-	-	-	1	-	-
Md.	-	-	2	-	-	-	1	-	7	3	5	-	27
D.C.	6	-	1	-	-	-	-	-	5	4	-	-	2
Va.	-	-	-	-	-	-	-	-	-	1	-	-	4
W. Va.	10	-	7	-	-	1	-	-	10	4	1	2	58
N.C.	1	-	-	-	-	-	-	-	-	1	-	-	4
S.C.	6	-	NN	-	-	2	-	-	3	8	1	3	16
Ga.	2	-	-	-	-	1	-	-	4	2	1	1	10
Fla.	4	-	-	-	-	-	-	-	19	5	-	-	16
	19	-	38	-	-	1	-	1	22	64	16	-	31
E.S. CENTRAL	5	-	12	-	-	2	4	-	15	40	5	1	11
Ky.	-	-	7	-	-	-	-	-	8	10	2	1	3
Tenn.	2	-	NN	-	-	-	2	-	4	15	1	-	11
Ala.	2	-	5	-	-	-	-	-	1	3	2	-	6
Miss.	1	-	-	-	-	2	2	-	2	12	-	-	2
W.S. CENTRAL	28	-	9	-	-	20	1	1	34	100	74	1	139
Ark.	-	-	-	-	-	-	-	-	4	8	1	-	8
La.	7	-	NN	-	-	-	-	-	12	30	15	-	42
Okla.	2	-	-	-	-	-	1	1	6	16	8	-	12
Tex.	19	-	9	-	-	20	-	-	12	46	50	1	77
MOUNTAIN	4	-	38	-	-	3	-	-	9	42	18	-	79
Mont.	-	-	22	-	-	-	-	-	1	-	-	-	1
Idaho	-	-	-	-	-	-	-	-	-	3	-	-	1
Wyo.	-	-	-	-	-	-	-	-	-	1	-	-	2
Colo.	2	-	16	-	-	-	-	-	2	18	2	-	32
N. Mex.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
Ariz.	-	-	NN	-	-	3	-	-	5	17	10	-	16
Utah	-	-	-	-	-	-	-	-	1	3	4	-	15
Nev.	2	-	-	-	-	-	-	-	-	-	2	-	8
PACIFIC	4	-	47	-	-	2	9	1	25	39	5	3	685
Wash.	1	-	26	-	-	-	-	1	14	19	3	-	48
Oreg.	3	-	-	-	-	-	-	-	11	19	2	3	39
Calif.	NA	NA	NA	NA	NA	NA	8	-	NA	NA	NA	NA	576
Alaska	-	-	13	-	-	2	-	-	-	-	-	-	6
Hawaii	-	-	8	-	-	-	1	-	-	1	-	-	16
Guam	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	3
P.R.	-	-	7	-	-	-	-	-	1	11	2	-	3
V.I.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pac. Trust Terr.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NN: Not notifiable. NA: Not available.

All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 11, 1980, and October 13, 1979 (41st week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1980	CUM. 1980	CUM. 1979	1980	CUM. 1980	CUM. 1979	1980	CUM. 1980	1980	1980	CUM. 1980	CUM. 1980
UNITED STATES	56	13,004	12,348	41	2,090	2,124	76	7,386	42	19	3,377	55
NEW ENGLAND	-	671	289	3	112	120	9	569	-	-	205	2
Maine	-	33	17	-	5	7	5	293	-	-	68	1
N.H.	-	328	33	-	8	13	-	21	-	-	37	-
Vt.	-	226	119	1	14	6	-	12	-	-	3	-
Mass.	-	58	14	1	39	44	3	120	-	-	69	-
R.I.	-	2	102	1	9	7	1	27	-	-	9	1
Conn.	-	24	4	-	37	43	-	96	-	-	19	-
MID. ATLANTIC	8	3,794	1,527	7	378	329	15	830	10	2	557	7
Upstate N.Y.	2	696	648	2	117	114	4	123	5	1	212	2
N.Y. City	-	1,190	776	2	69	76	-	92	2	1	98	2
N.J.	-	827	57	1	79	80	2	108	-	-	101	-
Pa.	6	1,081	46	2	83	59	9	507	3	-	146	3
E.N. CENTRAL	8	2,429	3,218	3	240	233	29	2,778	12	2	814	3
Ohio	2	380	270	-	79	95	6	1,133	8	-	8	1
Ind.	-	92	214	-	37	42	1	126	-	1	346	-
Ill.	1	341	1,434	-	49	18	3	366	2	-	163	-
Mich.	5	241	827	2	60	59	15	832	-	-	126	1
Wis.	-	1,375	473	1	15	19	4	321	2	1	171	1
W.N. CENTRAL	-	1,317	1,745	2	83	67	2	283	1	1	194	3
Minn.	-	1,101	1,218	1	24	12	-	16	-	-	27	1
Iowa	-	-	16	-	9	11	1	44	-	-	9	-
Mo.	-	65	410	1	36	33	-	99	1	1	41	1
N. Dak.	-	1	21	-	1	1	-	4	-	-	5	-
S. Dak.	-	-	2	-	5	4	-	2	-	-	2	-
Nebr.	-	83	11	-	-	-	-	9	-	-	1	-
Kans.	-	67	67	-	8	6	1	109	-	-	109	1
S. ATLANTIC	33	1,947	1,917	8	501	514	10	1,011	6	2	337	10
Del.	-	3	1	-	2	5	-	40	-	-	1	-
Md.	1	83	16	1	47	45	1	335	-	-	71	1
D.C.	-	-	-	-	2	-	-	4	-	-	1	-
Va.	30	335	274	1	50	72	-	66	-	-	51	3
W. Va.	-	14	56	1	19	8	7	106	-	1	25	1
N.C.	-	130	113	-	92	78	1	93	1	-	46	1
S.C.	-	159	168	-	57	59	-	206	-	-	53	3
Ga.	-	826	474	5	92	75	-	5	2	-	-	-
Fla.	2	397	815	-	140	172	1	156	3	1	89	1
E.S. CENTRAL	1	333	207	4	185	155	3	866	6	-	82	4
Ky.	-	55	37	2	58	31	1	753	3	-	38	1
Tenn.	1	172	61	2	50	44	2	29	3	-	39	2
Ala.	-	22	85	-	50	38	-	24	-	-	3	1
Miss.	-	84	24	-	27	42	-	60	-	-	2	-
W.S. CENTRAL	4	957	914	14	228	319	3	265	2	9	132	18
Ark.	-	14	7	-	19	24	-	21	-	-	4	2
La.	-	12	250	9	88	118	-	68	2	-	11	5
Okla.	1	776	22	-	17	33	-	-	-	1	6	1
Tex.	3	155	635	5	104	144	3	176	-	8	111	10
MOUNTAIN	2	488	319	-	74	84	1	196	2	1	147	-
Mont.	-	2	53	-	3	9	1	56	-	-	44	-
Idaho	-	-	18	-	4	8	-	16	1	-	21	-
Wyo.	-	-	36	-	3	1	-	-	-	-	1	-
Colo.	-	24	68	-	19	5	-	53	1	-	12	-
N. Mex.	NA	13	38	-	9	5	NA	-	NA	NA	5	-
Ariz.	1	393	77	-	14	35	-	35	-	-	31	-
Utah	-	47	18	-	5	9	-	27	-	1	27	-
Nev.	1	9	11	-	17	12	-	9	-	-	6	-
PACIFIC	-	1,068	2,212	-	289	303	4	588	3	2	909	8
Wash.	-	177	1,130	-	52	52	3	134	2	2	84	-
Oreg.	-	-	61	-	47	25	-	71	-	-	62	-
Calif.	NA	878	938	-	181	210	NA	352	NA	NA	746	8
Alaska	-	6	17	-	9	6	-	12	1	-	12	-
Hawaii	-	7	66	-	-	10	1	19	-	-	5	-
Guam	NA	5	12	-	1	1	NA	10	NA	NA	2	-
P.R.	-	153	350	-	9	5	-	137	-	-	20	11
V.I.	NA	6	5	-	1	3	NA	2	NA	NA	-	-
Pac. Trust Terr.	NA	6	8	-	-	1	NA	20	NA	NA	1	-

NA: Not available.

All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 11, 1980, and October 13, 1979 (41st week)

REPORTING AREA	TUBERCULOSIS		TULA- REMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) {RMSF}		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA		SYPHILIS (Pri. & Sec.)				
	1980	CUM. 1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	CUM. 1979	1980	CUM. 1980	CUM. 1979	
UNITED STATES	402	21,474	164	12	375	25	1,058	18,860	784,627	786,028	469	20,839	19,404	5,107
NEW ENGLAND	7	599	6	1	11	-	13	615	20,031	19,251	6	412	370	54
Maine	1	43	-	-	1	-	-	51	1,156	1,334	-	5	10	23
N.H.	1	15	-	-	-	-	-	20	721	715	-	3	16	7
Vt.	-	19	-	-	-	-	-	11	464	469	-	5	1	-
Mass.	5	328	4	-	7	-	6	339	8,441	7,673	4	242	210	14
R.I.	-	57	1	-	1	-	2	30	1,282	1,573	-	26	12	1
Conn.	-	137	1	1	2	-	5	164	7,967	7,487	2	131	121	9
MID. ATLANTIC	80	3,516	3	1	74	-	46	2,505	86,617	86,110	60	2,919	2,900	64
Upstate N.Y.	21	703	1	-	14	-	14	560	16,239	14,547	3	259	212	33
N.Y. City	39	1,258	1	1	32	-	3	1,000	33,467	33,788	43	1,894	1,954	-
P.A.	1	734	1	-	15	-	17	945	16,128	15,542	14	356	383	12
N.J.	19	821	-	-	13	-	12	NA	20,783	22,233	NA	410	351	19
E.N. CENTRAL	37	3,082	1	5	41	-	26	3,090	121,877	122,727	43	1,981	2,473	774
Ohio	10	554	-	4	11	-	13	938	32,430	33,733	6	299	475	49
Ind.	-	323	-	-	-	-	2	183	12,098	10,405	1	150	177	66
Ill.	24	1,094	-	-	17	-	6	893	38,268	38,581	28	1,131	1,385	419
Mich.	NA	922	1	1	9	-	3	818	27,784	28,828	5	326	368	15
Wis.	3	189	-	-	4	-	2	258	11,297	11,180	3	75	68	225
W.N. CENTRAL	28	787	27	-	26	1	53	1,043	37,813	38,756	13	282	256	1,645
Minn.	1	141	1	-	3	-	-	207	6,174	6,429	-	96	69	185
Iowa	4	75	1	-	2	-	3	92	4,034	4,665	8	22	28	360
Mo.	11	363	22	-	18	1	34	461	16,870	16,637	4	134	119	329
N. Dak.	1	41	-	-	-	-	-	11	532	657	-	3	2	195
S. Dak.	3	41	-	-	1	-	2	29	1,121	1,306	-	4	2	354
Nebr.	-	30	1	-	1	-	4	47	2,881	2,738	-	7	5	87
Kans.	8	96	2	-	1	-	10	196	6,201	6,324	1	16	31	135
S. ATLANTIC	98	4,706	9	-	38	15	674	6,185	197,656	189,817	145	5,051	4,610	398
Dal.	-	64	-	-	1	-	2	49	2,804	3,150	-	14	24	1
Md.	10	570	2	-	2	-	72	932	21,033	23,429	7	350	299	29
D.C.	11	281	-	-	4	-	-	333	13,744	12,542	7	374	358	-
Va.	22	530	-	-	7	2	92	489	18,001	18,281	13	448	381	14
W. Va.	3	165	-	-	3	-	5	89	2,660	2,567	-	15	44	22
N.C.	23	853	3	-	3	10	303	978	28,907	27,379	19	363	364	20
S.C.	3	418	-	-	3	3	141	602	18,631	17,850	11	293	232	54
Ge.	NA	606	4	-	3	-	54	1,088	38,597	35,951	53	1,465	1,187	195
Fla.	26	1,219	-	-	15	-	5	1,625	53,279	48,668	35	1,729	1,621	63
E.S. CENTRAL	80	1,991	10	-	11	4	109	1,669	64,261	67,036	66	1,745	1,264	280
Ky.	18	444	-	-	3	-	18	153	9,416	9,008	2	110	135	122
Tenn.	27	653	7	-	1	3	59	617	23,188	24,172	27	730	535	113
Ala.	9	513	1	-	3	-	17	599	19,057	19,814	10	385	232	45
Miss.	26	381	2	-	4	1	15	300	12,600	14,042	27	520	362	-
W.S. CENTRAL	39	2,440	68	5	60	5	117	2,581	99,554	100,671	119	4,201	3,527	1,199
Ark.	5	271	42	-	5	3	28	192	7,882	7,850	11	163	118	155
La.	5	462	-	1	2	1	3	388	18,138	17,727	61	1,055	891	13
Okla.	-	251	18	-	4	1	59	286	10,001	9,991	2	82	72	207
Tex.	29	1,456	8	4	49	-	27	1,715	63,533	65,103	45	2,901	2,446	824
MOUNTAIN	12	591	29	-	21	-	16	852	30,306	31,581	9	511	392	217
Mont.	-	28	9	-	1	-	3	NA	1,020	1,566	3	5	8	49
Idaho	1	24	1	-	1	-	1	14	1,305	1,418	-	25	24	2
Wy.	1	19	4	-	-	-	2	20	895	905	-	10	8	15
Colo.	5	97	6	-	7	-	5	351	8,307	8,321	3	129	75	54
N. Mex.	NA	111	1	NA	2	NA	4	NA	3,583	3,919	NA	86	71	42
Ariz.	5	248	1	-	7	-	-	337	8,288	8,826	-	176	114	51
Utah	-	38	5	-	3	-	1	43	1,538	1,609	3	16	3	3
Nev.	-	26	2	-	-	-	-	87	5,370	5,017	-	64	89	1
PACIFIC	21	3,762	11	-	93	-	4	320	126,512	130,079	8	3,737	3,612	476
Wash.	12	335	-	-	3	-	-	NA	10,462	11,469	NA	171	174	-
Oreg.	5	144	4	-	9	-	1	218	8,882	8,201	4	89	142	4
Calif.	NA	3,149	6	NA	81	NA	3	NA	101,465	103,924	NA	3,337	3,197	428
Alaska	-	54	1	-	-	-	-	48	3,147	4,034	-	8	21	44
Hawaii	4	80	-	-	-	-	-	54	2,556	2,451	4	132	78	-
Guam	NA	36	-	NA	1	NA	-	NA	83	94	NA	4	-	-
P.R.	-	127	-	-	8	-	-	53	2,155	1,730	9	489	443	43
V.I.	NA	-	-	NA	-	NA	-	NA	108	132	NA	10	7	-
Pac. Trust Terr.	NA	33	-	NA	-	NA	-	NA	334	375	NA	-	1	-

NA: Not available.

All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE IV. Deaths in 121 U.S. cities,* week ending
October 11, 1980 (41st week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P & I** TOTAL	REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P & I** TOTAL
	ALL AGES	>85	45-64	25-44	<1			ALL AGES	>85	45-64	25-44	<1	
NEW ENGLAND	658	451	143	36	10	38	S. ATLANTIC	1,089	595	297	76	70	38
Boston, Mass.	193	115	55	10	5	15	Atlanta, Ga.	162	93	42	13	8	5
Bridgeport, Conn.	36	24	9	2	-	2	Baltimore, Md.	125	67	37	8	6	-
Cambridge, Mass.	22	18	2	1	-	1	Charlotte, N.C.	70	31	24	9	3	2
Fall River, Mass.	18	14	3	-	1	-	Jacksonville, Fla.	90	46	29	4	3	2
Hartford, Conn.	63	40	18	4	-	1	Miami, Fla.	119	56	43	11	4	3
Lowell, Mass.	25	18	3	4	-	1	Norfolk, Va.	45	24	12	5	2	3
Lynn, Mass.	22	15	5	2	-	-	Richmond, Va.	52	26	16	2	6	2
New Bedford, Mass.	21	14	4	2	1	-	Savannah, Ga.	30	16	9	2	2	1
New Haven, Conn.	41	28	9	-	1	3	St. Petersburg, Fla.	83	69	8	1	3	7
Providence, R.I.	82	56	19	7	-	6	Tampa, Fla.	67	41	11	3	7	7
Somerville, Mass.	8	7	1	-	-	1	Washington, D.C.	192	101	47	13	26	6
Springfield, Mass.	34	23	5	1	2	3	Wilmington, Del.	54	25	19	5	-	-
Waterbury, Conn.	34	30	3	-	-	-							
Worcester, Mass.	59	49	7	3	-	6							
							E.S. CENTRAL	716	410	197	41	41	35
MID. ATLANTIC	2,473	1,604	566	166	73	78	Birmingham, Ala.	105	59	23	6	9	2
Albany, N.Y.	61	36	15	4	5	-	Chattanooga, Tenn.	56	33	17	4	1	2
Allentown, Pa.	20	16	4	-	-	-	Knoxville, Tenn.	48	33	12	3	-	1
Buffalo, N.Y.	128	80	35	5	8	4	Louisville, Ky.	117	66	31	8	9	13
Camden, N.J.	28	17	8	2	1	-	Memphis, Tenn.	168	89	48	10	16	6
Elizabeth, N.J.	29	21	8	-	-	2	Mobile, Ala.	54	37	12	3	-	4
Erie, Pa.†	44	31	9	2	1	-	Montgomery, Ala.	68	35	24	1	4	2
Jersey City, N.J.	45	27	15	2	1	1	Nashville, Tenn.	100	58	30	6	2	5
Newark, N.J.	46	23	16	4	1	1							
N.Y. City, N.Y.	1,345	860	303	109	31	30	W.S. CENTRAL	1,031	599	275	56	46	38
Paterson, N.J.	33	16	11	5	1	-	Austin, Tex.	44	32	6	4	-	-
Philadelphia, Pa.†	227	138	52	16	13	10	Baton Rouge, La.	31	20	4	2	4	2
Pittsburgh, Pa.†	60	36	18	3	2	2	Corpus Christi, Tex.	42	24	11	3	3	3
Reading, Pa.	31	27	3	1	-	2	Dallas, Tex.	189	99	53	-	11	3
Rochester, N.Y.	150	112	24	7	3	18	El Paso, Tex.	63	37	19	3	1	2
Schenectady, N.Y.	32	24	8	-	-	-	Fort Worth, Tex.	86	52	24	5	4	9
Scranton, Pa.†	20	16	4	-	-	1	Houston, Tex.	136	67	43	17	2	3
Syracuse, N.Y.	95	64	19	3	6	1	Little Rock, Ark.	46	32	11	2	1	4
Trenton, N.J.	36	25	8	3	-	3	New Orleans, La.	111	63	32	7	4	-
Utica, N.Y.	16	14	2	-	-	1	San Antonio, Tex.	120	72	30	7	7	8
Yonkers, N.Y.	27	21	4	-	-	2	Shreveport, La.	82	47	25	2	7	-
							Tulsa, Okla.	81	54	17	4	2	4
E.N. CENTRAL	2,193	1,319	565	171	62	84	MOUNTAIN	605	375	140	50	18	23
Akron, Ohio	78	47	18	10	2	-	Albuquerque, N. Mex.††	62	36	15	7	1	4
Canton, Ohio	39	28	10	1	-	2	Colo. Springs, Colo.	37	23	9	4	1	2
Chicago, Ill.	484	280	128	50	11	12	Denver, Colo.	120	76	28	8	2	6
Cincinnati, Ohio	86	50	27	4	3	13	Las Vegas, Nev.	58	28	16	10	1	-
Cleveland, Ohio	200	107	57	19	2	5	Ogden, Utah	14	7	5	2	-	-
Columbus, Ohio	136	77	37	9	6	5	Phoenix, Ariz.	123	82	23	10	3	1
Dayton, Ohio	102	63	28	4	5	2	Pueblo, Colo.	28	20	8	-	-	2
Detroit, Mich.	291	173	75	30	9	9	Salt Lake City, Utah	52	28	9	4	9	2
Evansville, Ind.	39	27	9	3	-	1	Tucson, Ariz.	111	75	27	5	1	6
Fort Wayne, Ind.	58	38	14	4	2	5							
Gary, Ind.	13	7	1	3	1	-							
Grand Rapids, Mich.	49	34	7	3	4	3	PACIFIC	1,835	1,189	393	116	66	68
Indianapolis, Ind.	157	86	43	13	6	2	Berkeley, Calif.	9	6	2	1	-	3
Madison, Wis.	45	28	9	3	2	4	Fresno, Calif.	59	35	17	4	1	2
Milwaukee, Wis.	144	94	38	4	1	6	Glendale, Calif.	25	17	6	-	1	1
Peoria, Ill.	46	31	10	1	3	2	Honolulu, Hawaii	52	29	15	4	2	6
Rockford, Ill.	46	31	9	4	1	5	Long Beach, Calif.	97	63	25	5	3	4
South Bend, Ind.	44	31	9	-	-	3	Los Angeles, Calif.	586	387	115	36	18	16
Toledo, Ohio	92	57	26	4	2	5	Oakland, Calif.	76	56	10	6	2	6
Youngstown, Ohio	44	30	10	2	2	-	Pasadena, Calif.	40	26	9	2	1	1
							Portland, Ore.	137	93	21	8	13	2
W.N. CENTRAL	697	456	147	38	34	18	Sacramento, Calif.	74	52	12	5	3	4
Des Moines, Iowa	70	50	15	2	3	3	San Diego, Calif.	153	93	37	11	6	1
Duluth, Minn.	16	10	4	1	-	-	San Francisco, Calif.	153	97	35	7	6	2
Kansas City, Kans.	22	14	4	1	-	-	San Jose, Calif.	151	87	42	15	2	8
Kansas City, Mo.	128	89	25	7	4	4	Seattle, Wash.	134	83	33	9	3	11
Lincoln, Nebr.	39	26	8	4	-	4	Spokane, Wash.	48	36	10	-	1	-
Minneapolis, Minn.	93	53	18	7	10	2	Tacoma, Wash.	41	29	4	3	4	1
Omaha, Nebr.	60	39	17	3	1	1							
St. Louis, Mo.	153	97	31	6	12	6							
St. Paul, Minn.	67	46	12	5	2	1							
Wichita, Kans.	49	32	13	2	1	1	TOTAL	11,297	5,998	2,723	750	420	420

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza

††Because of changes in reporting methods in these 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†Data not available this week. Figures are estimates based on average percent of regional totals.

Measles — United States, First 39 Weeks of 1980

As of September 27, 1980 (the 39th reporting week), investigations by immunization project* staff revealed only 1 active chain of transmission† of measles in the United States. Projects in 15 other counties throughout the country reported isolated cases that were not associated with documented spread (Figure 1).

The single outbreak, which began September 9 and is still being investigated, occurred in Warren County, Virginia. The index patient was a 15-year-old girl, who had been exposed to the disease in England. A rash developed after she returned to Virginia on September 9. Four of her siblings subsequently had onset of measles from September 18-21. An additional 27 suspected cases—all in persons attending the same private day school in Rappahannock County—are being investigated in 5 contiguous counties.

Nationwide, 12,881 cases of measles were reported for the first 39 weeks of this year. This is second only to last year's total (12,207) as being the lowest ever recorded for a comparable period. Actually, the incidence of measles this year has been lower than in 1979 for all periods except March 23-July 12 (weeks 13-29, Figure 2). For 9 of the last 11 weeks, the reported numbers of cases have been record lows, and the 23 cases reported in week 39 were the fewest ever reported for a single week.

*State or local health jurisdictions which have been awarded federal funding for immunization programs.

†An active chain of transmission is one in which there are 2 or more epidemiologically linked cases, and less than 4 weeks has elapsed since onset of rash in the last known case.

FIGURE 1. U.S. counties* with measles, week ending September 27, 1980 (39th reporting week)



*In CALIFORNIA: Contra Costa, Glenn, Imperial, Los Angeles, San Diego, San Francisco, and Tulare counties; FLORIDA: Broward and Pinellas counties; ILLINOIS: McLean; MISSOURI: Gentry; NEW YORK: Kings; OHIO: Columbiana; TEXAS: Harris and Uvalde; VIRGINIA: Warren; WISCONSIN: Marathon.

Measles — Continued

Thirty-one states and the District of Columbia have not reported any measles cases in the last 4 weeks. Since January 1, 1980, 41 states and the District of Columbia have not reported any cases of measles for at least a 4-week period. Only Arizona, California, Florida, Illinois, Minnesota, New York, Ohio, Texas, Wisconsin, and New York City have not had as many as 4 consecutive measles-free weeks this year.

During the first 39 weeks of 1980, 20 states had a measles incidence of $>10/100,000$ among persons <18 years old, whereas 24 states reported such rates in 1979. Thus far in 1980, 9 states have reported a measles incidence of $<1/100,000$, as did only 5 states in the same period last year.

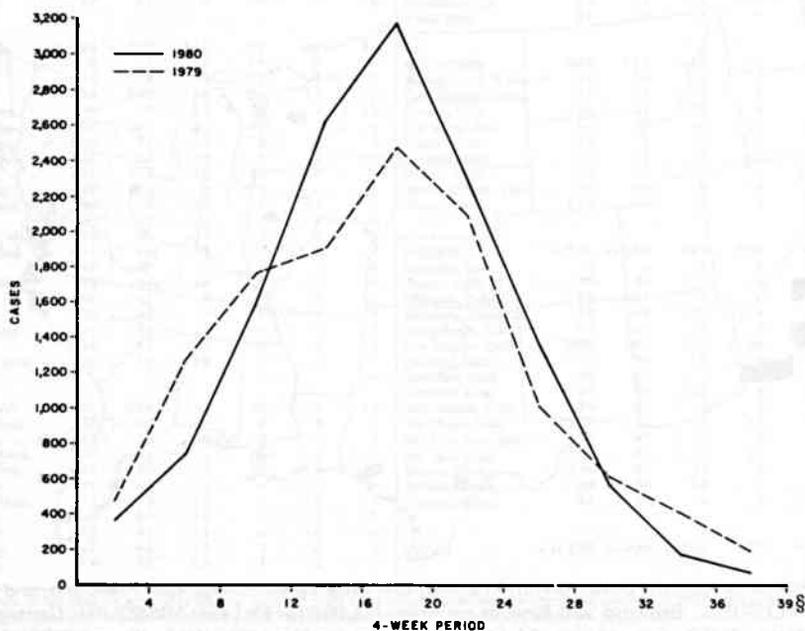
Reported by RS Wood, MD, GA Dengel, MD, PD Pedersen, MD, Warren County Health Dept; J Einardon, MD, Rappahannock County, Virginia; G Miller, MD, State Epidemiologist, Virginia State Dept of Health; and Immunization Div, Bur of State Services, CDC.

Editorial Note: The record low numbers of reported cases of measles in recent weeks and the fact that there is only 1 known active chain of transmission in the United States indicate that transmission of measles has been interrupted throughout most of the country. Intensive measles outbreak control efforts are thus even more important in the few areas still reporting measles. Prompt attention should be paid to reports of isolated cases since they may develop into continuing outbreaks. An integral part of measles outbreak control programs should be excluding students who do not have valid evidence of measles immunity not only from the schools reporting measles cases but also from other schools in the area that are at risk of measles introduction (1).

Reference

1. MMWR 1978;27:427-30, 435-7.

FIGURE 2. Reported measles cases, by 4-week period, 1979-1980 ‡



‡ Through the 39th reporting week. § 3-week period

Suspected Dengue — Laredo, Texas

Two virus isolations have been made from patients with dengue-like illness in Laredo, Texas. The viruses are flaviviruses, and further laboratory testing will determine if they are dengue virus.

One of the patients, who had onset of illness on September 23, had not traveled outside Laredo; the other patient had onset on September 11 and may have been exposed during a preceding trip to Monterrey, Mexico. A field investigation conducted October 7-10 by staff from the Laredo-Webb County Health Department, the Texas State Department of Health, and CDC revealed no substantial increase in the prevalence of dengue-like illness in Laredo during recent weeks.

Aedes aegypti mosquitoes were found at the residence of the indigenous case. Their distribution elsewhere in the community was sporadic and limited. The low density of vector mosquitoes may have resulted from dry weather and active control: the total rainfall in Laredo for the year has been 6 inches, about 8 below average. The Laredo-Webb County Health Department has promoted household cleanup to limit breeding sites and has made repeated ultra-low-volume insecticide applications to kill adult mosquitoes. Reported by Sister CA Corley, Mercy Hospital, Laredo; L Garcia, RN, P Gonzales, MPH, Laredo-Webb County Health Dept; C Marshall, MD, R Davis, RPE, J Bromberg, MPH, C Webb, Jr, MD, State Epidemiologist, Texas State Dept of Health; San Juan Laboratories, Bur of Laboratories, Vector Biology and Control Div, Bur of Tropical Diseases, and Viral Diseases Div, Bur of Epidemiology, CDC.

Current Trends

Influenza — United States, Worldwide

United States: During late August and early September, influenza A(H3N2) strains were isolated in Hawaii from a sporadic pediatric case in Oahu and from an outbreak of illness in a nursing home on the Island of Hawaii. H3N2 virus was also isolated in September from a student at the University of Alaska. Inquiries about the previous report (1) of an H3N2 virus recovered in Washington State in July indicate that the patient became ill in Juneau, Alaska, on a cruise, shortly after a group of tourists from Anchorage came aboard. Several of these visitors reportedly had influenza-like symptoms. Further investigation of the 3 persons from whom H3N2 virus was isolated in Houston, Texas, during July (1) has revealed that 2 had recently returned from travel to various locations on the East Coast. Recent H3N2 isolates have been well inhibited by antiserum to A/Bangkok/1/79. A limited outbreak of influenza A(H1N1) was detected in Puerto Rico by complement-fixation and hemagglutination-inhibition testing of several paired

The Morbidity and Mortality Weekly Report, circulation 91,840, is published by the Center for Disease Control, Atlanta, Georgia. The data in this report are provisional, based on weekly telegraphs to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Center for Disease Control, Attn: Editor, Morbidity and Mortality Weekly Report, Atlanta, Georgia 30333.

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Influenza—Continued

serum specimens collected in the Mayaguez region during September. As has occurred on several previous occasions, serum specimens collected in Puerto Rico for confirmation of dengue virus infection resulted in the laboratory diagnosis of influenza.

Worldwide: The All-Union Institute for Influenza in Leningrad, USSR, reported the isolation in May of a small number of influenza A(H2N2) strains similar to A/Singapore/1/57. Most of the strains were identified during investigation of an outbreak of influenza-like illness among a group of 1- to 3-year-old children. No reports of influenza A(H2N2) isolations have been received from elsewhere in the USSR or the world.

Reported by P Glezen, MD, Baylor College of Medicine, Houston; State Laboratory Directors in Alaska, Hawaii, Puerto Rico, Texas, and Washington; World Health Organization Collaborating Center for Influenza, Virology Div, Bur of Laboratories, Immunization Div, Bur of State Services, and Bur of Epidemiology, CDC.

References

1. MMWR 1980;29:453-4.

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